Notice of Allowability	Application No.	Applicant(s)	
	09/786,666	HAWKINS ET AL.	
	Examiner	Art Unit	
	Jezia Riley	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Amdt filed 9/17/03*.
2. ☒ The allowed claim(s) is/are *18-44 and 46-48*.
3. ☒ The drawings filed on 6/15/01 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
   (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

8. ☐ CORRECTED DRAWINGS must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No. ____.
   (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
   (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

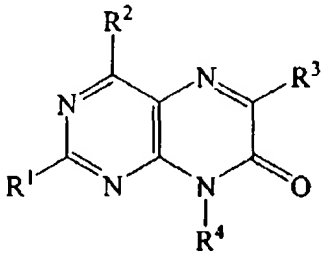
Attachm nt(s)

1☐ Notice of References Cited (PTO-892)
2☐ Notice of Informal Patent Application (PTO-152)
3☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
4☐ Interview Summary (PTO-413), Paper No.____ .
5☐ Information Disclosure Statements (PTO-1449), Paper No. ____.
6☐ Examiner's Amendment/Comment
7☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
8☐ Examiner's Statement of Reasons for Allowance
9☐ Other

JEZIA RILEY
PRIMARY EXAMINER

ALLOWED CLAIMS/ TJ

18. (Previously amended) An oligonucleotide comprising one or more nucleotide monomers, said monomers having the formula



wherein:

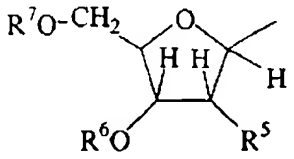
R^1 is a member selected from the group consisting of hydrogen and optionally substituted C_1-C_6-alkyl;

R^2 is a member selected from the group consisting of amino and mono- or di-substituted amino wherein the substituent is a protecting group;

R^3 is optionally substituted C_1-C_6 alkyl;

R^4 is L;

L is of the formula



wherein:

R^5 is a member selected from the group consisting of hydrogen and hydroxyl;

R^6 is a member selected from the group consisting of hydrogen, a phosphate, a phosphate covalently attached to a nucleotide, a phosphate covalently attached to a nucleoside; a hemisuccinate covalently bound to a solid support, a dicyclohexylcarbodiimide covalently bound to a solid support, and a hydroxyalkyl covalently bound to a solid support; and

R^7 is a member selected from the group consisting of hydrogen, a phosphate, a phosphate covalently attached to a nucleotide and a phosphate covalently attached to a nucleoside;

wherein at least one of R^6 and R^7 is a phosphate covalently attached to adenosine.

19. (Previously amended) An oligonucleotide in accordance with claim 18, wherein:

R^1 is hydrogen;

R^2 is amino;

R^3 is methyl;

R^5 is hydrogen and hydroxyl;

R^6 is hydrogen; and

R^7 is a phosphate covalently attached to adenosine.

20. (Original) An oligonucleotide in accordance with claim **19,** wherein:

R^5 is hydrogen.

21. (Original) An oligonucleotide in accordance with claim **19** wherein:

R^5 is hydroxyl.

22. (Previously amended) An oligonucleotide in accordance with claim 18, wherein:

R^1 is optionally substituted C_1-C_6-alkyl;

R^2 is amino;

R^3 is methyl;

R^5 is hydrogen and hydroxyl;

R^6 is hydrogen; and

R^7 is a phosphate covalently attached to adenosine.

23. (Previously amended) An oligonucleotide in accordance with claim 22, wherein

R^1 is methyl; and

R^5 is hydrogen.

24. (Previously amended) An oligonucleotide in accordance with claim 22, wherein

R^1 is methyl; and

R^5 is hydroxyl.

25. (Original) An oligonucleotide in accordance with claim 18, wherein said nucleotide monomers are at the 3' end of said oligonucleotide.

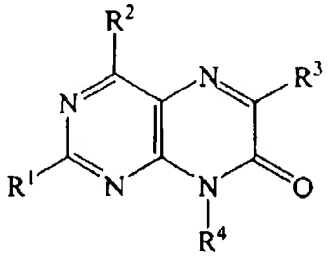
26. (Original) An oligonucleotide in accordance with claim 18, wherein said nucleotide monomers are at the 5' end of said oligonucleotide.

27. (Original) An oligonucleotide in accordance with claim 18, wherein said nucleotide monomers are surrounded by 1 to 10 pyrimidine monomers.

28. (Previously amended) An oligonucleotide in accordance with claim 18, wherein said oligonucleotide is a member selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9, SEQ ID NO:10, SEQ ID NO:11, SEQ ID NO:12, SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21 and SEQ ID NO:22.

29. (Previously amended) A method of detecting the presence, absence, or quantity of a target nucleic acid, said method comprising the steps of:

a) contacting said target nucleic acid with a nucleic acid probe wherein said nucleic acid probe comprises compound of the formula:



wherein:

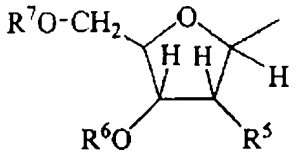
R^1 is a member selected from the group consisting of hydrogen and optionally substituted C_1-C_6-alkyl;

R^2 is a member selected from the group consisting of amino and mono- or di-substituted amino wherein the substituent is a protecting group;

R^3 is optionally substituted C_1-C_6 alkyl;

R^4 is L;

L is of the formula



wherein:

R^5 is a member selected from the group consisting of hydrogen and hydroxyl;

R^6 is a member selected from the group consisting of hydrogen, phosphoramidite, an H-phosphonate, a methyl phosphonate, a phosphorothioate, a phosphotriester, a hemisuccinate, a hemisuccinate covalently bound to a solid support, a dicyclohexylcarbodiimide, and a dicyclohexylcarbodiimide covalently bound to a solid support; and

R^7 is a member selected from the group consisting of a phosphate covalently attached to a nucleotide and a phosphate covalently attached to a nucleoside;

wherein, at least one of R^6 and R^7 is a phosphate covalently attached to adenosine;

located in said probe such that, when said probe hybridizes to said target nucleic acid said compound is in a loop that does not participate in complementary base pairing with a nucleotide of said target nucleic acid; and

b) detecting the fluorescence produced by said fluorescent nucleotide when said probe forms a hybrid duplex with said target nucleic acid.

30. (Original) A method of claim 29, wherein said loop ranges in length from about 1 to about 100 nucleotides when said probe hybridizes to said target nucleic acid.

31. (Original) A method of claim 29, wherein said loop is an insertion in said nucleic acid probe which is otherwise complementary to said target nucleic acid or to a contiguous subsequence of said target nucleic acid.

32. (Original) A method of claim 31, wherein said insertion is three nucleotides in length and comprises two nucleotides each adjacent to said compound.

33. (Original) A method of claim 32, wherein at least one nucleotide adjacent to said compound is a purine.

34. (Original) A method of claim 33, wherein at least one nucleotide adjacent to said compound is an adenosine.

35. (Original) A method of claim 32, wherein at least one nucleotide adjacent to said compound is a pyrimidine.

36. (Original) A method of claim 35, wherein at least one nucleotide adjacent to said compound is a cytosine.

37. (Original) A method of claim **34**, wherein said compound is bordered by at least two adjacent purines in both the 5' and 3' direction.

38. (Original) A method of claim **37**, wherein said adjacent purines are adenosine.

39. (Original) A method of claim **31**, wherein said insertion is said compound.

40. (Original) A method of claim **31**, wherein said insertion is self-complementary and forms a hairpin wherein said compound is present in the loop of said hairpin and does not participate in complementary base pairing.

41. (Original) A method of claim **29**, wherein the nucleotides comprising said loop are selected such that they are not complementary to the corresponding nucleotides of the target nucleic acid when said probe is hybridized to said target nucleic acid and wherein said probe is complementary to at least two non-contiguous subsequences of said target nucleic acid.

42. (Original) A method of claim **29**, wherein said fluorescent nucleotide is present in a terminal subsequence of said nucleic acid probe wherein said terminal subsequence does not hybridize to said target nucleic acid when the remainder of said nucleic acid probe hybridizes to said target nucleic acid.

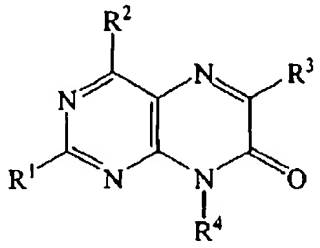
43. (Original) A method of claim **42**, wherein said terminal subsequence forms a terminal hairpin by hybridization with a second subsequence of said probe such that said fluorescent nucleotide is present in a loop of said hairpin and does not participate in complementary base pairing.

44. (Original) A method of claim **29**, wherein said detecting comprises detecting an increase in fluorescence of said fluorescent nucleotide when said probe forms a hybrid duplex with said target nucleic acid.

46. (Previously added) An oligonucleotide in accordance with claim 18 wherein R^6 and R^7 are both adenosine.

47. (Previously added) An oligonucleotide in accordance with claim 46 wherein an adenosine is next to R^6 and an adenosine is next to R^7.

48. (Previously represented - formerly dependent claim 45) A kit for the detection of nucleic acid-nucleic acid interactions comprising instructions for use, and a container, said container containing a compound of the formula:



wherein:

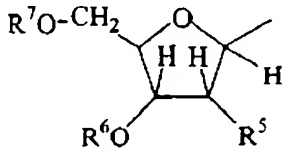
R^1 is a member selected from the group consisting of hydrogen and optionally substituted C_1-C_6-alkyl;

R^2 is a member selected from the group consisting of amino and mono- or di-substituted amino wherein the substituent is a protecting group;

R^3 is optionally substituted C_1-C_6 alkyl;

R^4 is L;

L is of the formula



wherein:

R^5 is hydroxyl;

R^6 is a member selected from the group consisting of hydrogen, phosphoramidite, an H-phosphonate, a methyl phosphonate, a phosphorothioate, a phosphotriester, a hemisuccinate, a hemisuccinate covalently bound to a solid support, a dicyclohexylcarbodiimide, and a dicyclohexylcarbodiimide covalently bound to a solid support, a hydroxyalkyl, and a hydroxyalkyl covalently bound to a solid support; and

R^7 is a member selected from the group consisting of hydrogen, a phosphate, a triphosphate, and a protecting group.